



## 6 COLD, DAMP AND MOULD

*Compared to housing in other OECD countries, New Zealand housing is inadequately heated and usually cold.*

**T**HE World Health Organisation (WHO) recommends an indoor temperature of 18°C, or 21°C for young, elderly or disabled people. The NZ Building Code requires temperatures to be able to be maintained above 16°C in old people's homes and childcare centres. Older people often do not notice temperature changes as quickly as younger people.

Below 12°C, cold hands and feet and slight lowering of core temperatures can create a short-term rise in blood pressure which is dangerous for older people.

One million New Zealand homes, more than two out of three, were built before minimum insulation was required in 1977. In 2001, one in four (300,000) had no insulation, and about half are only partly insulated.<sup>172</sup>

New Zealand houses are cold. The temperature in almost a third of New Zealand homes is below WHO recommendations.<sup>173</sup> A 1989 survey of 36 units for older people found that minimum daily temperatures in the living room were below 16°C more than one third of the time during the year.<sup>174</sup> The BRANZ Household Energy End-Use Project (HEEP) from 2002 found that average house temperatures do not seem to have risen since the 1970s. The mean temperature in Auckland houses was 16.5°C. Uninsulated houses were on average 1.4°C colder.

Those who need to heat their homes for the longest are often least able to do so because of low incomes and inefficient housing. Living in healthy temperatures would take more than 10% of their income.

Some older people and other low-income households may therefore keep their room temperatures too low for comfort, enduring 'voluntary hypothermia' to save money. In the 2001 census, 36,000 people did not have any form of heating. In 1996, 18 in every 1,000 New Zealanders and 31 in every 1,000 Maori women lived



*".. insulating cold houses more than pays for itself by improving people's health and saving electricity."*

in a dwelling where no heating was used.

### Cold, damp, mould and health

Dampness and cold are the most common health hazards of poor housing. "A damp dwelling is more difficult to heat and a poorly heated dwelling more susceptible to damp. Cold air has a higher relative humidity, increasing the risk of condensation indoors and providing a more favourable environment for the growth of moulds and micro-organisms."<sup>175</sup> Overcrowded housing is more likely to be damp, especially if poorly aired or shut in bad weather.

Portable, unflued gas heaters, common in New Zealand homes, carry their own health risks (See Substandard housing and health, page 21).

In poorly insulated houses, moisture from cooking, drying and cleaning will condense as dampness. In bedsits or when a bedroom door is open, if the room is colder than other parts of the house this dampness will condense on the bed.

Howden-Chapman cites English, USA and Dutch studies which found that the damper the houses were, the more likely their occupants were to be ill with a wide range of medical symptoms, regardless of smoking, income or crowding.<sup>176</sup>

Children living in damp houses are more likely to have respiratory problems, fevers, sore throats, headaches and skin problems than those in dry homes. Adult symptoms include nausea, vomiting, constipation, blocked noses, breathlessness, backache, aching joints and fainting. Elderly people are more vulnerable.

Maori and Pacific households were more likely to report cold and damp in their homes, and had higher rates of respiratory illnesses than Pakeha households.<sup>177</sup>

More than half the Otara residents in a 2004 survey believed the condition of their houses could affect the wellbeing of a healthy person, largely due to cold and mould from lack of insulation. During winter, families who could not afford heating were forced to huddle into one room in the evening. A higher proportion of private tenants reported problems with cold than state tenants.

"Poor ventilation in my house causes the asthmatic person to constantly have asthma attacks."<sup>178</sup>

Dust mites, tiny parasites that live in carpets and mattresses, are an asthma trigger. Dust mites need moisture to breed and rarely survive under 50% humidity. Asthmatics who live in damp housing have more asthma attacks, use more asthma



drugs and have to go to the hospital more often.<sup>179</sup>

A UK study found that using steam and heat to eradicate house dust mites reduced asthma symptoms for people in the house, and improved allergic reactions. For people who had a ventilation system installed in their bedroom, this improvement continued for 12 months.<sup>180</sup>

Damp houses encourage the growth of moulds and fungi, which are strongly associated with respiratory problems and asthma.<sup>181</sup> Everyone is exposed to some mould spores every day, but in large numbers mould spores usually cause health problems. A third of New Zealand households reported visible mould in a 2002 national survey.<sup>182</sup>

Mould can produce allergic reactions, respiratory problems, nose and sinus congestion, eye or throat irritation and skin rashes. People who already have asthma are at greater risk, as even a small number of spores could trigger an asthma attack.

Certain types of greenish-black moulds produce toxins that cause coughing, runny nose, burning sensations in the mouth or nose, nose bleeds, headache, fatigue and skin irritation at the site of contact.

There are few standards for judging acceptable quantities of mould; it is usually measured by the size of visible mould patches. Active mould is easily smelt. One study found the amount people worried about mould affected their reporting of respiratory symptoms.<sup>183</sup>

“Like the mould’s black marks on the wall, in the bedrooms and that, cos it smells.”<sup>184</sup>

Cold houses have been associated with poorer general health and increased use of health services. Indoor temperatures under 16°C significantly increase the risk of respiratory infections. One study of 1,376 South Auckland children in Pacific families found that more than half had cold homes and 37% reported damp, which were associated with asthma and probable depression for the mothers.<sup>185</sup>

New Zealand has greater seasonal fluctuations in death rates, particularly in those aged over 65, than countries with more extreme climates. More than four out of five deaths at home from a drastic drop in body temperature (hypothermia) are in people over 65. One Auckland study found that cold stress was the dominant climatic factor in cardiovascular deaths.<sup>186</sup>

Concern about family health in a damp and mouldy home, a reluctance to receive guests, and the cost of repairs can cause emotional distress. Women are more likely than men to be emotionally upset due to



*“Indoor temperatures under 16°C significantly increase the risk of respiratory infections.”*

disturbed sleep and frustration from trying to keep a mouldy house clean and organise repairs.

## Occupant behaviour

People’s actions can be as important as the construction of the house in making homes damp. Leaving the window open during a shower, drying wet clothes outside and airing a house regularly will lower the level of dampness in the air compared to an identically built house where people do none of these things.

A series of Otara hui in 1998 found that many residents did not understand the importance of insulation and ventilation. Some people did not know how to use heaters or set temperatures. The importance of ventilation to reduce dangerous levels of carbon monoxide from unflued gas heating was not widely known.

The British Medical Association concluded in a major report: “A warm, damp-free healthy indoor environment requires adequate ventilation, heating and insulation. Strategies that do not address all three factors are unlikely to succeed.”<sup>187</sup>

## New Zealand initiatives about cold, damp and mould

→ The Housing, Insulation and Health Study found that insulating cold houses more than pays for itself by improving people’s health and saving electricity. It involved 1,400 households in Otara and six other locations around the country. The people in the houses reported that their health improved, adults visited their family doctor significantly less and both adults and children took fewer days off. These benefits were valued at \$3,640 per house, twice the \$1,800 cost of installing insulation.<sup>188</sup>

→ HNZC started its 10-year Energy Efficiency project in 2001. It aims to improve the living environment of all state houses built before 1977. It involves installing or improving ceiling and floor insulation, hot water cylinder and pipe wraps, adjusting thermostats, improving housing heating and ventilation and redressing dampness under houses.

→ Since 1995, the Energy Efficiency Conservation Authority (EECA) has installed insulation in ceilings and under floors, wrapped hot water cylinders and pipes, put in draught stopping on doors and windows, energy-efficient light bulbs and damp proof groundsheets in 12,000 older homes. This has cost the Govern-



ment \$15 million. Projects work in partnership with local community groups using previously unemployed local people to do the work. Current projects are running in South Auckland and Waitakere City.

Since 2002 EECA has focused on low income households, with some partnerships with HNZC. EECA is seeking more funding partnerships with other government agencies and the private sector, as the savings in health are greater than those in energy.

→ A Winter Heating Information Pack has been developed in Christchurch for residents and agencies that carry out home visits.

→ Researcher Cameron Grant is carrying out a study in central and west Auckland about the relation of childhood pneumonia to crowding, damp, mould, leaks, heating, nutrition and primary care. Results are expected in late 2005.

## Overseas initiatives about cold, damp and mould

→ The UK has introduced several initiatives to help low income households in cold homes. The Home Energy Efficiency Act 1995 requires local councils to have plans for improving the energy efficiency of housing in their area and to report progress to government.<sup>189</sup>

→ The UK Government has adopted a Fuel Poverty Strategy, which includes grants to households in rented and owner-occupied homes to improve the energy efficiency of their houses and winter fuel payments for people over 60.<sup>190</sup>

→ The UK National Heart Forum's Fuel Poverty Toolkit educates primary health workers about the links between lack of money to afford heating fuel and ill health, helps them identify people suffering from this fuel poverty and refer them to available grants.<sup>191</sup>

→ California passed the Toxic Mold Protection Act in 2001, which calls for standards for permissible levels of mould and requires information about mould contamination to be provided in housing sales.

→ The New York City Department of Health has also issued Guidelines on Assessment and Remediation of Fungi in Indoor Environments.

## POSSIBLE ACTIONS

→ Expand retrofitting programmes which provide insulation and ventilation in older houses.

→ Implement policies to improve energy efficiency in households with low incomes.<sup>192</sup>

→ Improve state rental housing standards, including ventilation, dehumidifiers or air-conditioning, extraction fans and good insulation.<sup>193</sup>

→ Require all properties to display an energy-efficiency warrant of fitness or rating before being rented out or sold.

→ Apply building regulations about insulation retrospectively to private landlords.<sup>194</sup>

→ Use passive solar building design rather than building houses off the ground.<sup>195</sup>

→ Provide households in high-risk accommodation with information about how to reduce damp and cold.<sup>196</sup>



## 7 HAZARDS AND INJURY

*The vast majority of accidents and injuries to New Zealanders over 65 happen at home.*

ONE UK report stated that more than one-third of all adult injuries happen in the home. However, the literature surveyed for this report concentrated on injuries to children. Every year 15,000 New Zealand children are hospitalised because of unintentional injuries, most commonly in their home.<sup>197</sup> Many more are treated at hospital or private emergency clinics or by GPs.

The vast majority of these injuries are preventable and predictable. Safekids says it is more effective to remove hazards or separate children from them than to rely on constant supervision around hazards.

The UK British Medical Association said that household injuries were highest in the private rental sector, indicating inadequate monitoring and maintenance by landlords.<sup>198</sup> Comparable information for New Zealand was not available in the research surveyed.

In the UK, injury rates for children in poor families are more than three times those of children in affluent families. Preventing injuries is a low priority for families living in poverty, who do not have enough food or money to pay bills.<sup>199</sup>

Poor housing can increase injury risks through exposed heating sources, unprotected upper windows, high balconies and stairs, breakable window glass in high-traffic sites, flammable materials and lack of functioning smoke alarms. The 1999 Mercy House Women's Advocacy Group study concluded that unintentional injuries for children were inevitable in Glen Innes state houses due to the high numbers of young children, poor housing design, lack of safety features and lack of tenant income to fix them.

### Vehicle injuries

Nearly every day a New Zealand child is hospitalised after being hit by a vehicle and around 20 child pedestrians die every year. Two out of five of these children are reversed over in their own or a neighbouring driveway. Shared driveways or a lack of fencing between driveways and play

areas triple the risk of injury.

In the Glen Innes survey, four out of five houses had inadequate fences around driveways; some had none and most were partially fenced and easy for children to climb over. One third shared a driveway.

"We asked Housing NZ for a fence to stop the children from going on the road, but no reply. We are so close to this busy road."<sup>200</sup>



*Gil Hanly*

*"In the UK, free window guards, a mass media campaign, home inspection and landlord regulation led to a 50% decrease in falls and a 35% drop in child deaths in two years."*

### Fire

Fires are a major cause of mortality, particularly among poorer people who are more likely to smoke. Five New Zealand children on average die in house fires each year, and another 20 are injured.

Children in rental properties seem to have a higher risk than those in owner-occupied homes. In 70% of fatal fires, a smoke alarm would have helped the victims to escape.<sup>201</sup> In 1999, 10% of Glen Innes houses surveyed had no smoke alarms and another 10% were faulty.

Tenants who do not know how smoke alarms work may also disconnect them from the battery when the batteries run down, or not replace batteries.

Two Auckland emergency housing clients in the Healthful Housing study spoke of fire hazards in rental houses from a poorly installed wood-burning heater and a stove with faulty wiring.<sup>202</sup> Both asked for the hazards to be repaired but they did not feel they got satisfactory responses.

Housing NZ Corporation is currently installing smoke alarms in its houses but there is no requirement for private landlords to do this. People who have their power disconnected due to money shortages have to use candles, increasing the risk of fire.

### Heating appliances and hot water hazards

Around 640 New Zealand children are hospitalised for burns and scalds every year, most under five. Around one in four is from household water which has come out too hot from the tap. Almost one third of the Glen Innes tenants said in 1999 that their water was too hot when they held their wrists under the hot tap for more than a few seconds.

The majority of older New Zealand houses have water coming out of the tap at 60°C or higher, which will burn a child's skin in one second. New houses have had tempering valves installed since 1993, which enable water to be stored at 60°C



and come from the tap at 55°C. At 55°C it takes ten seconds for water to burn a child or older person. However, the HEEP study of 217 houses reported inaccurate thermostat and valve control in up to one third of houses in 2002.

Each year ovens are involved in burn and scald injuries to children when they touch hot elements, pull pots off stove tops or climb on oven doors so that ovens tip hot food. More than one in three Glen Innes houses surveyed by Mercy House in 1999 did not have their ovens chained to the wall or the floor, making them a tipping hazard.

Open fires and unflued gas heaters release small particles which irritate the lungs and may reduce people's resistance to illness. Poorly maintained gas appliances can release carbon monoxide, high levels of which may be deadly.

## Poisoning

On average, three New Zealand children will be hospitalised every day as a result of unintentional poisonings from medicines, cleaning or garden chemicals, most in their own home.

## Falls

More than a child a day is hospitalised due to a fall from stairs, steps, a balcony, deck or window. In the Mercy House survey of Glen Innes houses, more than a third had windows with a fall height of two metres or more. Most of these windows had no safety catches to prevent children climbing out. Several balconies had inadequate hand rails, usually with concrete surfaces below.

A 2004 survey of Otara households identified ongoing safety concerns among state housing tenants.

"The steps going upstairs are too dangerous for my kids. I even got a letter from my family to give to Housing New Zealand describing our situation and the need for us to move to a one-storey building."<sup>203</sup>

## Glass hazards

On average, five children a week are hospitalised for injuries from plate glass, mostly at home. Most of the glass in pre-1991 houses is not safety glass, so it shatters into jagged edges. Safety glass is much stronger, breaks less easily and either fractures into pieces too small to injure or stays in place. It is also more ex-

pensive. Tenants are responsible for the replacement of broken glass in rented houses. However, glass only needs to be replaced to pre-existing quality, which in most homes is ordinary glass even in doors, side panels and low-level glazing.

## Electricity

Every two weeks on average, a child is hospitalised due to contact with an electric current, usually as a result of a faulty appliance or wiring, or poking metal objects into live sockets or appliances.<sup>204</sup> Insufficient power points can lead families to use multiboxes, which will not cut the electrical flow in a fault. None of the Glen Innes houses surveyed by Mercy House had safety shutters on power points and one in five tenants reported either exposed wires or electrical cabling they considered unsafe.

## Safety initiatives

→ The HNZC Modernisation Programme started in 2001 and aims to improve around 15,500 houses built before 1979. It involves modernising kitchens and bathrooms, installing additional power points, adding driveways, parking and fencing, adding rooms and installing heating devices.

→ Safekids is working with HNZC on safety issues in state houses following its *Safe as Houses* report.

→ In the UK, free window guards for people living in high-rise buildings, together with a mass media campaign, home inspection and local regulation for landlords led to a 50% decrease in falls and a 35% drop in child deaths in two years.<sup>205</sup>

→ Preventive home visits required by Denmark cities contributed to a marked reduction in the hospital bed occupancy rate among people over 75.<sup>206</sup>

## POSSIBLE ACTIONS

- Require public health representation on all bodies setting building standards.
- Improve monitoring of health and safety standards in rental housing.<sup>207</sup>
- Require a warrant of fitness that includes safety checks for all rental properties before they are rented out.
- Adequately fund preventive safety audits of older people's housing.<sup>208</sup>



# 8 BEYOND MONOCULTURAL HOUSING

## Designing appropriate housing for Maori whanau

Housing policy, regulations and the design of houses have largely assumed Pakeha cultural norms, and regulatory bodies may be resistant to Maori housing initiatives.<sup>209</sup> See Appendix 1 for Maori perspectives about housing.

“..these houses were designed by English people who are happy to have their washing machine next to the sink or even wash their pants in the sink ... well I wasn't going to be happy washing my babies' nappies in there ... they (Housing Corporation) acted as if it was my problem and then I had to go to the bottom of the list and there was nothing I could do...”<sup>210</sup>

Maori have consistently criticised state housing policy and practice for failing Maori, and not including Treaty of Waitangi principles.<sup>211</sup>

Maori researchers have also identified health initiatives as failing Maori if they do not take into account Maori people's poorer access to social resources, and if they are based on whole population analyses.<sup>212</sup> They have argued for health promotion initiatives to be based on Treaty rights, using Maori needs as a starting point.



*“..these houses were designed by English people who are happy to have their washing machine next to the sink..”*

which allow good opportunities for outdoor living, communal gatherings, gardens and safe tamariki play space.”<sup>214</sup>

Design features include -

- Flexibility to adapt to residents' changing needs and fluctuating occupancies. Allowance needs to be made for future extensions and additional buildings such as a garage, wing addition or kaumatua flat. These flats need two bedrooms so that a grandchild or caregiver can live in.
- Large living rooms able to accommodate a whanau gathering of up to 20 people. This can be likened to a marae whareniui (meeting house) where visitors are received, welcomed and sleep, where meetings and celebrations are held and sometimes where a tupapaku (deceased family member) will lie.
- Kitchens able to comfortably accommodate two or more people, especially when catering for gatherings, and kitchen storage which allows for bulk foods and big pots.
- Outside preparation and washing areas for seafood and other food preparation, cooking and eating.
- Distinctions between tapu (sacred or prohibited) and noa (common or profane) functions. For example, all food facilities must be separate from bathrooms, toilets and laundries. The dining room or kitchen should not be next to the laundry, toilet or bathroom and nor should a living or dining room. The laundry and bathroom should generally be kept separate.

## Initiatives about Maori housing

→ Housing New Zealand is developing Maori housing strategies and in 2002 released design principles for Maori housing. (See Appendix 1 for Maori perspectives about housing.)

→ Maori architects have worked on plans for the Healthy Housing Programme in Auckland.

→ Five current pilot Maori housing projects are underway, including a house in Blenheim.<sup>213</sup>

“Maori whanau generally prefer low density residential developments

Table 4 - Tapu and noa relationships for rooms in a house

	Main entry	Laundry	Toilet	Bathroom	Living room	Dining room	Kitchen
Bedroom	✘	~	~	~	~	✘	✘
Kitchen	~	✘	✘	✘	✓	✓	
Dining room	~	✘	✘	✘	✓		
Living room	✓	✘	✘	✘			
Bathroom	✘	~	✘				
Toilet	✘						
Laundry	✘						

~ Neutral  
 ✘ Conflict  
 ✓ Desirable relationship

From HNZA Design Guide Ki te Hau Kainga



## Designing houses for Pacific families

State houses from the 1960s and 1970s are particularly poorly suited to Pacific families, lacking the space to adequately entertain guests during Pacific gatherings (see Appendix 1 for Pacific perspectives about housing).<sup>215</sup>

## Initiatives about housing for Pacific people

→ Housing New Zealand is developing Pacific housing strategies and in 2002 released design principles for Pacific housing.

→ The Tokelau Community Housing Project is refurbishing an existing state house and designing and building a new state house in East Porirua for a multi-generation family.<sup>216</sup>

→ Pacific people have identified some basic needs -

- Larger family homes.
- A large, square main room which can be used for meeting, eating, sleeping and relaxing.
- Big kitchens so several people can cook at once, with large, high up storage areas.
- Separation of private family spaces from the rooms used by visitors.
- More and larger toilets and bathrooms.
- Larger bedrooms.
- Fences for children.
- No shared driveways so families can line up in their own driveways, especially for family gatherings.
- An outdoor food preparation area.<sup>217, 218</sup>

## POSSIBLE ACTIONS

- Establish a Maori Housing Authority.
- Provide training and other programmes to enable iwi, hapu other Maori organisations, and Pacific groups to provide housing services.
- Ensure Maori and Pacific input into community renewal, urban design and sustainable development initiatives.
- Develop programmes allowing collective ownership; for example –
  - Collective ownership of land and individual ownership of mortgages, with loans secured against the house rather than the land
  - Whanau-owned homes with whanau-based mortgages
  - Iwi, hapu or whanau-owned rental housing.<sup>219</sup>



## 9 CONCLUSION

THE RESEARCH summarised in this report indicates that ill-health and poverty related to poor or crowded housing have become entrenched in deprived areas of Auckland.

Many sources stressed the seriousness of housing poverty as a contributor to poor health and social problems. Professor Mason Durie said that housing is more important to Maori health than the delivery of health services.<sup>220</sup> A group of NGOs said in 2003 that “..the extent of the unaffordable housing problem cannot be overstated.”<sup>221</sup> The Child Poverty Action Group refers to the re-appearance of “a widespread cycle of social disadvantage reinforced by housing poverty”.<sup>222</sup>

There are many gaps in the research summarised here. For example, there is no locally validated measure of crowding, little local research about crowding and health, and almost no longitudinal research.

Although affordability and discrimination in housing are major issues for mental health service users, there is little information about health impacts for this population. This summary did not include adult domestic injury figures or the relationship between household injuries and tenure.

This report lists several recent housing initiatives, almost all relating to the state housing sector. There are very few initiatives in privately-owned rental housing.



Gil Hanly

*“..only a co-ordinated and sustained effort, backed by significant additional and long-term funding, will be able to shift the correlation between poor housing in deprived areas of Auckland and poor health..”*

Evaluations have shown that the Healthy Housing Programme and the EECA insulation retrofitting programme, for example, have had a positive effect on residents’ health. Several other initiatives are too recent to have been evaluated.

Interventions suggested by the research fall into five broad categories – policy changes; funding increases for provision of social housing; improved housing standards; incentives and sanctions for private landlords; and improved monitoring.

Many suggestions from the research are included in the Government’s *Building the Future: The New Zealand Housing Strategy* and some positive housing initiatives such as the Healthy Housing Programme have been given ongoing support.

The Strategy is potentially far-reaching and exciting; however, many of its proposed strategies are broad and exploratory and lack any specific outcomes or measures.

Until now, there has been no national co-ordination or prioritisation of housing interventions, so they have tended to be ad hoc. *Building the Future* provides a more co-ordinated overview, but there is no guarantee that any housing strategy will last beyond its originating government.

The research reviewed here stresses that only a co-ordinated and sustained effort, backed by significant additional and long-term funding, will be able to shift the correlation between poor health and poor housing in deprived areas of Auckland.



Gil Hanly